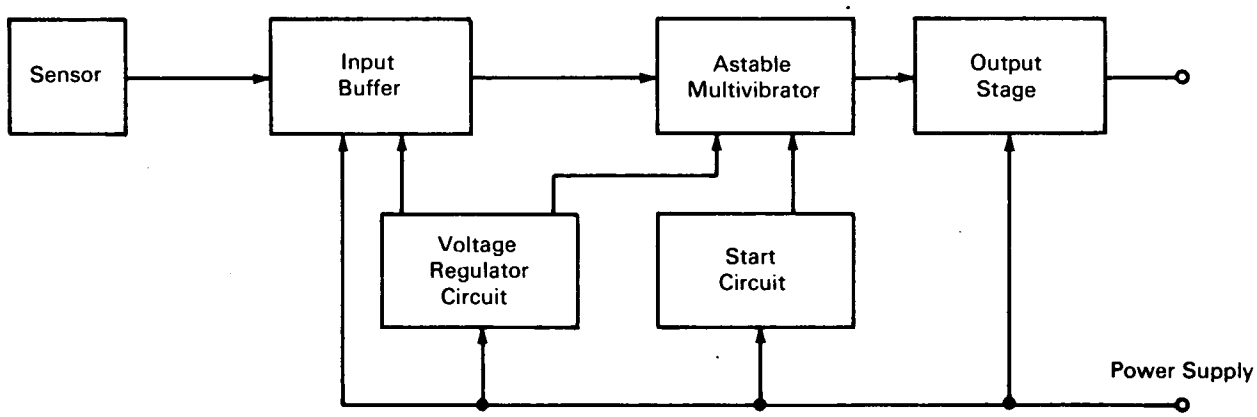
August 1967

Brief 67-10251

NASA TECH BRIEF

An Efficient, Temperature-Compensated Subcarrier Oscillator



The problem:

To design a temperature-compensated telemetry subcarrier oscillator whose output frequency will be an essentially linear function of the magnitude of an input signal from a sensor. In addition to the requirement for temperature stability, the oscillator must consume a minimum of power and have a high input impedance.

The solution:

A circuit employing an input buffer with a field effect transistor which effectively serves as a solid state temperature-compensating element.

How it's done:

The subcarrier oscillator includes an astable multivibrator consisting of a pair of regeneratively coupled transistors and an input buffer which provides temperature-compensated base voltage to the transistors as a function of the input signals from the sensor.

The input buffer includes a field effect transistor whose gate electrode is coupled to the input signal from the sensor and whose source electrode is coupled to the base electrodes of the multivibrator transistors. The drain electrode of the field effect transistor is connected to an adjustable drain-current-control circuit. This circuit is adjusted to compensate for the collector-emitter saturation voltage variations of the multivibrator as well as for any mismatch in buffer-component temperature coefficients. The input buffer also includes transistorized circuitry which provides the high input impedance for the subcarrier oscillator. The voltage regulator ensures temperature-compensated collector voltage to the multivibrator transistors.

Note:

Inquiries concerning this invention may be directed to:

Technology Utilization Officer
NASA Pasadena Office
4800 Oak Grove Drive
Pasadena, California 91103
Reference: B67-10251

(continued overleaf)

Patent status;

This invention has been patented by NASA (U.S. Patent No. 3,325,749), and royalty-free license rights will be granted for its commercial development. Inquiries about obtaining a license should be addressed to NASA, Code GP, Washington, D.C. 20546.

Source: E. D. Lawrence and D. C. Mead
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